

Directory of Analytical and Materials Testing Services for Historic Preservation

July 1998

US Department of the Interior
National Park Service
**National Center for
Preservation Technology and Training**

Introduction

The preservation of artifacts, historic buildings, monuments, and archaeological sites frequently requires scientific analysis of cultural materials or testing of specific properties of chemical treatments in order to document historic evidence, clarify deterioration processes, and specify conservation treatments.

Analyses of the variety of materials constituting our cultural heritage require the expertise of many different scientific disciplines such as organic and inorganic chemistry, geology and geochemistry, mineralogy, nuclear chemistry and physics, botany, microbiology, entomology, physics, and engineering. However, professionals in other scientific disciplines may not have the necessary understanding and expertise required for meaningful analytical work in historic preservation.

There are only a handful of laboratories specializing in, and dedicated to, the study and analysis of cultural property. Scientists with such expertise often work at museums and other cultural institutions that have a specific mandate to concentrate primarily on their own collections or historic properties in their care.

Students and researchers at universities, colleges and research organizations, are occupied with their research and support for their parent organization, and find it difficult to undertake outside analytical work unless it is consistent with their ongoing research or leads to a publication.

Government laboratories are mandated to actively pursue technology transfer, and unfortunately, routine analytical work does not fall in that category. Also, frequently their support is only available to other government organizations.

Several of the commercial service providers undertake materials testing, but they may not have adequate experience in performing analytical services that cater to the needs of the conservation professionals. These commercial laboratories are mainly used by conservation professionals who have enough scientific knowledge to be able to do their own data interpretation. There are, however, a few exceptions where laboratories have developed specific expertise in the study of historic materials and are able to provide data interpretation.

In order to assess the need for analytical and materials testing services for historic preservation, the National Center for Preservation Technology and Training began compiling a directory of laboratories in the United States that are willing to provide analytical services in the field of cultural heritage preservation. The directory was prepared from the responses to letters sent to laboratories and individuals, and inquiries posted on several discussion lists on the Internet, by Frank Preusser and Associates, Inc. While originally not intended to be a part of the directory, some dating laboratories and laboratories abroad have also been included. The listing is by no means exhaustive and will need to be regularly updated. Any individuals or organizations wishing to add their names to the listing may contact:

Mark Gilberg at NCPTT
NSU Box 5682
Natchitoches, LA 71497
Phone (318) 357-6464; Fax (318) 357-6421
mark_gilberg@ncptt.nps.gov.

Some Common Abbreviations for Analytical Techniques Used in Material Characterization

AAS	Atomic Absorption Spectroscopy
AEM	Analytical Electron Microscopy
AES	Auger Electron Spectrometry
AFM	Atomic Force Microscopy
AMS	Accelerator Mass Spectrometry
APCI	Atmospheric Pressure Chemical Ionization
CE	Capillary Electrophoresis
CI	Chemical Ionization
DSC	Differential Scanning Calorimetry
DMTA	Differential Mechanical Thermal Analysis
DTA	Differential Thermal Analysis
ECD	Electron Capture Detection
EDS	Energy Dispersive Spectrometry
EDXA	Energy Dispersive X-ray Analysis
EI	Electron Ionization
EM	Electron Microscopy
EPMA	Electron Probe Microanalysis
ESCA	Electron Spectroscopy for Chemical Analysis
ESI	Electrospray Ionization
FAB	Fast Atom Bombardment
FID	Flame Ionization Detection
FT-IR	Fourier Transform Infra-red Spectrometry
FT-NMR	Fourier Transform Nuclear Magnetic Resonance Spectrometry
GC	Gas Chromatography
GPC	Gel Permeation Chromatography
HPLC	High Performance Liquid Chromatography
IC	Ion Chromatography
ICP	Inductively Coupled Plasma
IR	Infra-red Spectroscopy/Reflectography
LC	Liquid Column Chromatography
LSC	Liquid Scintillating Spectrometry
MALDI	Matrix Assisted Laser Desorption Ionization
MS	Mass Spectrometry
NMR	Nuclear Magnetic Resonance Spectrometry
PID	Photo Ionization Detection
PIXE	Particle Induced X-Ray Emission
PLM	Polarized Light Microscopy
PyGC	Pyrolysis Gas Chromatography
PyMS	Pyrolysis Mass Chromatography
RBS	Rutherford Backscattering Spectrometry
SAM	Scanning Auger Microscopy
SEM	Scanning Electron Microscopy
SIMS	Secondary Ion Mass Spectrometry
STM	Scanning Tunneling Microscopy
TEM	Transmission Electron Microscopy
TG	Thermal Gravimetry
TGA	Thermo-Gravimetric Analysis
TLC	Thin Layer Chromatography
TMA	Thermo-Mechanical Analysis
UV-VIS	Ultraviolet-Visible Range Spectrometry
WDS	Wavelength Dispersive Spectrometry
XPS	X-Ray Photoelectron Spectrometry
XRD	X-Ray Diffraction
XRF	X-Ray Fluorescence

Analytical and Materials Testing Services for Historic Preservation

Analytical Materials Laboratory d.b.a. Technology of Materials

Specialty: Analyses of ceramic materials, composites, cement, concrete, airborne particles, soil and clay minerals, metals, polymers, corrosion products.

Equipment/Techniques: XRD; DTA/TG; XRF; FTIR; Raman spectroscopy

Sample Required: n/a.

Waiting Period: 2 weeks.

Fees: Depends on type of analyses: \$ 100/hr. (microscopy); \$200/hr. (XRD); \$175/hr. (SEM).

Comments: Material characterization by X-ray powder diffraction and related techniques; interested in results.

Contacts: Sam Iyengar, Ph. D., Technical Director
3463 State Street #349
Santa Barbara, CA 93105
805 682-0051
Fax: 805 569-3382

E-Mail/Website: Iyengar@Rain.org

Applied Consumer Services, Inc.

Specialty: Paint, paper, wood, textile, particle size analysis, mildew and stain resistance testing, air testing, sick building syndrome studies, water analysis.

Equipment/Techniques: AAS (Varian); GC (HP and Tractor); TLC; FID; PID; ECD; MS; IR Spectroscopy; Visible Spectroscopy; XRD; XRF; NMR; Microscopy.

Sample Required: Inquire.

Waiting Period: 2-18 days.

Fees: Inquire.

Comments: Also accelerated weathering and exposure tests.

Contacts: Dr. Burch Stewart, President;
Galina Tuninskya
9500 N. W. 77 Avenue, Bay # 5
Hialeah Gardens, FL 33016
305 821-1677 800 371-5854
Fax: 305 821-0155

E-Mail/Website: AC1677@aol.com

Analytical and Materials Testing Services for Historic Preservation

Beta Analytic, Inc.

University Branch

Specialty: Radiometric and AMS Radiocarbon dating.
Equipment/Techniques: LSC, AMS, SEM, MS
Sample Required: 1-4g final carbon for radiometric; 0.5-1 mg for AMS **Waiting Period:**
Atomic Mass Spectrometry: 30-45 business days; ADVANCE: 6-14.
Radiometric: 30 business days; ADVANCE: 20 days; PRIORITY: 6 days.
Fees: Contact Beta Analytic for present prices.
Comments: Largest radiocarbon dating laboratory in the world; Over 100,000
analyses performed for 5000 scientists around the world.
Contacts: Darden Hood, President, Co-director;
Ronald Hatfield, Laboratory Manager;
Christopher Patrick, Associate Manager;
Teresa A. Zilko-Miller, Associate Manager
4985 S. W. 74 Court
Miami, FL 33155
305 667-5167
Fax: 305 663-0964
E-Mail/Website: Beta@radiocarbon.com
<http://www.radiocarbon.com>

Analytical and Materials Testing Services for Historic Preservation

Canadian Conservation Institute Conservation and Scientific Services

Specialty: Museum and archaeological objects; archival collections.
Equipment/Techniques: X-radiography; IR reflectography; Microscopy; SEM; X-ray micro-analysis; XRD; XRF; FTIR Spectrometry; HPLC; GC (mass selective detector); thermal analysis; AAS; UV-VIS spectrophotometer; Scanning spectrophotometer; physical/mechanical testing; shock and vibration testing; weatherometer testing; moisture content and strength; paper testing; paper permanency; color measurement.
Sample Required: Varies.
Waiting Period: Varies, typically 2 to 4 weeks.
Fees: quotations available upon request.
Comments: portable equipment for field work available.
Contacts: Mr. Cliff McCawley, Director;
Ian Wainwright, Manager, Analytical Research Laboratory;
David Grattan, Ph. D., Man., Conservation Processes and Materials Res.;
Charles Costain, Manager, Preventive Conservation Services
1030 Innes Road
Ottawa, ONT K1A 0M5, CANADA
613 998-3721
Fax: 613 998-4721
E-Mail/Website: ian_wainwright@pch.gc.ca; david_grattan@pch.gc.ca;
charles_costain@pch.gc.ca

Chemir/Polytech Laboratories, Inc

Specialty: Plastic, polymer, oil, ink, rubber, coating, paint, adhesive, surfactant.
Equipment/Techniques: FTIR; NMR; AA; ICP; HPLC; GC; GC/MS; GPC; LC-MS; XRD; IC; SEM/EDXA; Instron; DSC; TGA; DMA; TMA; melt flow indexer.
Sample Required: Depends.
Waiting Period: 2-8 weeks depending on project, 4 weeks average; rush service available (extra charge).
Fees: Competitive.
Comments: Extensive library of standard spectra of polymers, rubber, organics and inorganics.
Contacts: Shri Thanedar, Ph. D., Technical Director
2672 Metro Blvd.
Maryland Heights, MO 63043
314 291 6620
Fax: 314 291-6630
E-Mail/Website: shri@chemir.com

Analytical and Materials Testing Services for Historic Preservation

Corrosion Testing Laboratories, Inc.

Specialty: Metallography, accelerated corrosion test, metal, nonmetal, leachable material.

Equipment/Techniques: SEM; WDS; EDS; Olympus PME 3 Metallograph -50 to 2000x; Olympus MG Portable Metallograph 50 to 1000x; Olympus SZ-PT Stereo Microscope, Zoom 0.3 to 40x; Binocular scopes; Heat treat furnace; Hardness tester; Microhardness tester; more.

Sample Required: Varies.

Waiting Period: Work usually starts within 24 hrs. of receipt of samples.

Fees: Detailed fee schedule attached.

Comments: Certified to ASME Section III, Division I, Subsection NCA 3800 (Nuclear).

Contacts: Richard A. Corbett, Principal Corrosion Engineer
60 Blue Hen Drive
Newark, DE 19713
302 454-8200
Fax: 302 454-8204

E-Mail/Website: ctl@doa.net (Rick Corbett)

Daniel Grosjean and Associates, Inc (DGA) ***Research Consultants in Environmental Science***

Specialty: Environmental control, air pollution.

Equipment/Techniques: Analyzers for NO_x, CO, SO₂ and ozone; LC; IC; GC; environmental test chambers; photochemical flow reactor; exposure chamber for conservation studies, color meters.

Sample Required: Active and passive samplers, also continuous on-site measurements.

Waiting Period: n/a.

Fees: n/a.

Contacts: Daniel Grosjean, Ph.D., President
4526 Telephone Road, Suite 205
Ventura, CA 93003
805 644-0125
Fax: 805 644-0142

Analytical and Materials Testing Services for Historic Preservation

Desert Research Institute

Specialty: History of buildings involved in nuclear activities, building, architecture.
Equipment/Techniques: Nuclear testing.
Comments: No policy for outside work in place, no detailed information.
Contacts: Colleen M. Beck, Ph. D., Dr. James Taranik, Dr. William Grey Johnson
P. O. Box 60220
Reno, NV 89506
702 673-7312
Fax: 702 673-7421
E-Mail/Website: doherty@maxey.unr.edu

The Erlin Company

Specialty: Evaluation of concrete mortar, brick, terra cotta, dimension stone and other materials of construction; determinations of original composition, existing condition and future performance.
Equipment/Techniques: Scanning microscopes; petrographic microscopes; modified point-count equipment; XRD; wet chemistry; accelerated weathering; supplemental analytical work available through associated laboratories.
Sample Required: Variable.
Waiting Period: Variable.
Fees: Variable.
Comments: Experienced in evaluations of historic-type materials.
Contacts: Bernard Erlin, President/Petrographer
Mark E. Patton, Ph.D., P.E., Materials Engineer
X. Derek Cong, Ph.D., Petrographer
1693 Clearview
Latrobe, PA 15650
412 539-1800
Fax: 412 539-7305
E-Mail/Website: BE5023@aol.com

Analytical and Materials Testing Services for Historic Preservation

Erlin & Hime Associates

Construction Materials Consultants

A Division of Wiss, Janney, Elstner Associates, Inc.

Specialty: Testing of construction materials: cement, grout, mortar, stucco, concrete, fiber reinforcements, fabrics, sealants, adhesives, brick, terra cotta, glass, metals, tile, roofing materials, wood.

Equipment/Techniques: Cement analysis (air content, cement content); mortar analysis; petrography; chlorine analysis; IR spectroscopy; XRD; X-ray spectrography; DTA; SEM; IR microscope /FTIR microscope.

Sample Required: Depends.

Waiting Period: 2-3 weeks; special arrangements can be made.

Fees: Minimum \$100; professional staff \$60 to \$195/hr; tests depend.

Contacts: James D. Connolly, Senior Consultant, Division Manager
330 Pflingsten Road
Northbrook, IL 60062-2095
847 272-7730
Fax: 847 291 5189

E-Mail/Website: JDC@WJE.COM

Others: Tom S. Patty, Manager, Branch Office and Laboratory, Austin, TX
8222 Jamestown Drive, Bldg. A-113
Austin, TX 78758
512 835-0940
Fax: 512 835-6268

Frank Preusser & Associates, Inc.

Specialty: Painting, object, architecture, collection environment.

Fees: Hourly fee.

Comments: Will advise on test program, interpret results.

Contacts: Frank Preusser, Ph.D., President
Margarete Wieninger-Preusser, Vice-President
6434 Pat Avenue
West Hills, CA 91307
818 348-0481
Fax: 818 348-1764

E-Mail/Website: fdp@aol.com

Analytical and Materials Testing Services for Historic Preservation

Geochron Laboratories

A Division of Krueger Enterprises, Inc.

Specialty: Radiocarbon dating & AMS; K/Ar age determination; Rb/Sr age determination; Sr Isotope Analysis; isotopic analysis for archaeologists, anthropologists and geologists.

Sample Required: At least 1g of elemental carbon; smaller samples possible with AMS.

Waiting Period: Results usually within 90 days.

Fees: \$550/ sample for AMS; prices for other methods vary.

Comments: 30 years experience.

Contacts: Harold W. Kruger, President/Founder
Dr. Richard Reesman, K-Ar Lab Manager
Dr. Marshall Otter, SIRA Lab Manager
Dr. Alexander Cherkinsky, C-14 Lab Manager
711 Concord Ave
Cambridge, MA 02138
617 876-3691
Fax: 617 661-0148

Harvard University

Cambridge Accelerator for Materials Science

Gordon McKay Laboratory

Specialty: Non-destructive elemental analysis of paints, metals etc.

Equipment/Techniques: 1.7 MV tandem ion accelerator configured for PIXE and RBS

Sample Required: Depends upon application.

Waiting Period: About 2 weeks.

Fees: Academic fee structure \$50/hr.; industrial and governmental collaborations sought.

Contacts: John F. Chervinsky, Accelerator Manager & Engineer Faculty
Supervisors: Prof. Jene Golovchen, Prof. Michael J. Aziz
9 Oxford Street
Cambridge, MA 02138
617 495-3762
Fax: 617 496-4654

E-Mail/Website: John_Chervinsky@lucifer.harvard.edu
<http://www.mrsec.harvard.edu/cams/cams.html>

Analytical and Materials Testing Services for Historic Preservation

Harvard University

Materials Research Science and Engineering Center (MRSEC)

Gordon McKay Laboratory

Specialty: Materials preparation and analysis.

Equipment/Techniques: Preparation: metallurgy, ceramic & chemical prep. facilities, thin film, ion sputtering, thermal deposition;
Characterization: XPS, Cambridge accelerator (see separate listing), SAM (MIT), AFM, STM and EM, clean room/microfabrication facility, X-ray characterization facilities, mechanical testing and thermal measurements facilities, optical properties laboratory.

Sample Required: Depends on analytic technique.

Waiting Period: Inquire

Fees: Academic, industrial and governmental collaborations sought

Comments: Several facilities are shared with MIT.

Contacts: Frans Spaepens, Professor, Director
Robert Graham, Assistant Director.
9 Oxford Street
Cambridge, MA 02138
617 495-4595
Fax: 617 496-4654

E-Mail/Website: mrsce@harvard.edu
<http://www.mrsec.harvard.edu/>

Image Permanence Institute, RIT

Frank Gannett Memorial Building

Specialty: Tests for photographic image stability, film deterioration and enclosure quality.

Equipment/Techniques: Accelerated aging chambers, misc. instrumentation.

Sample Required: Varies.

Waiting Period: Varies.

Fees: Varies.

Comments: Testing per ANSI and ISO standards, also contrast research.

Contacts: James M. Reilly, Director
Douglas W. Nishimura;
Edward Zinn.
70 Lomb Memorial Drive
Rochester, NY 14623-5604
716 475-5199
Fax: 716 475-7230

Analytical and Materials Testing Services for Historic Preservation

McCrone Research Institute, Inc.

Specialty: Authentication of art & archaeological objects; Teaching courses in the use of microscopy in conservation and authentication.

Equipment/Techniques: Microscopy (all types); Micrometry; Microspectroscopy. Refractometry, Imaging; SEM; AEM.

Sample Required: subnanogram.

Waiting Period: Depends, will be determined by project leader.

Fees: Depends, consulting time \$125/hr., minimum.

Comments: Detailed information on file, no instrument rates.

Contacts: Walter C. McCrone, Director Emeritus
David A. Stoney, Director
2820 S. Michigan Ave.
Chicago, IL 60616-3292
312 842-7100
Fax: 312 842-1078

E-Mail/Website: Research Institute: Info@mcri.org
<http://www.mcri.org>

Mission Clay Products Division of MCP Industries, Inc,

Specialty: Clay, shale, raw material, sulfur, fluoride, inorganic carbon, organic carbon, quartz.

Equipment/Techniques: Perkin-Elmer IR Spectrophotometer; Leco DC-12 Carbon Determinator and Afterburner; Leco-SC-32 Sulfur Determinator; McCrone Micronizing Mill; Eurotherm Programmers; Soil Test Sedimentation, Honeywell Process Reporter.

Sample Required: Clay testing 25 lbs; TDA, DTGA 6 lbs or 1/2 brick, other methods less.

Waiting Period: n/a.

Fees: Staff time \$110/hr., samples \$30-\$330, rebate for more than 10 samples.

Comments: Testing of clays, shales and mixes for total fluoride and sulfur content to predict killing emission.

Contacts: A. Joel Frazier, Mgr. Ceramics Technology, Chief Geologist
P. O. Box 6, 826 East Fourth Street
Pittsburgh, KS 66762
316 231-1400
800 835-0320
Fax: 316 231-1475

Analytical and Materials Testing Services for Historic Preservation

Museum of American Textile History Textile Conservation Center

Specialty: Textile, fiber, yarn.
Equipment/Techniques: Tests of textile fibers with light polarizing microscope, age accelerating oven.
Sample Required: Requires fiber or yarn samples of 2-3 mm length.
Waiting Period: 1-2 weeks.
Fees: \$35 per microscopy sample; otherwise \$70 per hour.
Comments: An expansion of the analytical capabilities is planned in the future.
Contacts: Deirdre Windsor
Chief Conservator
491 Dutton Street
Lowell, MA 01854-4221
508 441-1198
Fax: 508 441-1412

National Park Service NE Cultural Resource Center Boot Cotton Mills Museum

Specialty: Paint, mortar, stone, petrography, wallpaper, paper, basic materials; control tests for masonry barrier coating, wood coating treatments.
Equipment/Techniques: Microscopy, FT-IR, chemical analysis.
Sample Required: Depends.
Waiting Period: 2 weeks or more.
Fees: Cost recovery basis.
Comments: Work must be for National Landmark, non-profit or government organization; special agreements may be necessary.
Contacts: Stephen Spaulding, Chief, Building Conservation Branch
400 Foot of John Street
Lowell, MA 01852-1195
508 970-5133
508 970-5127
Others: Bridget Sullivan, Curatorial Resources (508-970-5160);
Steve Penderrey, Architecture (508-970-5150);
Barbara Yocum (Specializes in wallpaper);
Peggy Albee (paint analysis);
Caroll Perault.(978-970-5133)

Analytical and Materials Testing Services for Historic Preservation

New York Conservation Center, Inc.

Specialty: Instrumental analysis of art, archaeological and architectural materials; paint and coatings analysis and matching; fibers analysis; metallurgical analysis; project analysis and planning.

Equipment/Techniques: Photo-microscopical laboratory with PLM, fluorescence, inverted stage metallograph, stereomicroscopes, video; UV/VIS Spectrometer; UV examination; basic chemical laboratory; local network as needed for IR reflectography, radiography, SEM/EDS, FTIR, other advanced instrumental techniques.

Sample Required: Call for planning.

Waiting Period: Call for planning.

Fees: Call for planning.

Comments: Library/Information Center (NYC) with 3000+ volumes and Internet searching.

Contacts: John Scott, MA, MA-CAS; Conservator Analyst, Director
519 W 26th St., mail to: P. O. Box 20098 LT
New York, NY 10011-0008
212 714-0620
Fax: 212 714 -0149

E-Mail/Website: jscott@panix.com

Others: Branch Office: 215 Forgedale Rd
Fleetwood, PA 19522
Phone/Fax: 610 944-5175

New York University Conservation Center of the Institute of Fine Arts

Specialty: Organic materials.

Equipment/Techniques: PyGC, PyGC/MS.

Comments: Institute has no official policy for outside work.

Contacts: Norbert Baer, Ph. D., Hagop Kevorkian Prof. of Conservation
14 East 78th Street
New York, NY 10021-1745
212 772-5800 (general) 212 772-5848
Fax: 212 772-5851

E-Mail/Website: baer@is.2.nyu.edu

Others: Shelley Sass, Program Coordinator, Conservation Center and Architectural Conservator.

Analytical and Materials Testing Services for Historic Preservation

The Ohio State University Department of Consumer and Textile Sciences

Specialty: Archaeological and historic textiles, dyes, mordants, fiber identification and characterization.

Equipment/Techniques: Optical microscopy, Brightfield, Darkfield, Phase Contrast, PLM, Differential Interference Contrast; SEM/EDS; FTIR Spectroscopy; DSC; XRD.

Sample Required: Depends on selected method and project goals.

Waiting Period: n/a.

Fees: Up to \$50 for preliminary examination; up to \$150 per sample.

Contacts: Kathryn A. Jakes, Professor and Chair
1787 Neil Avenue
Columbus, OH 43210-1295
614 292-8063
Fax: 614 292-7536

E-Mail/Website: jakes.1@osu.edu
<http://www.hec.ohio-state.edu/cts/index.htm>

Paleo Research Laboratory, Inc.

Specialty: Pollen, phytolith, macrofloral, charcoal, wood, protein residue.

Equipment/Techniques: Archaeobotanic lab.

Sample Required: Sampling manual provided.

Waiting Period: 60-120 days (report), rush samples for an additional fee.

Fees: 35/hr, analysis: \$80 to \$120 per sample, field visits: \$250/day plus expenses, sales tax if applicable.

Comments: Field consultation possible.

Contacts: Linda Scott Cummings, Ph. D., Director (owner) / palynologist & phytolith analyst
Kathryn Puseman, microfloral and blood residue analyst;
Tom Moutoux, palynologist;
Andria Bidwell, lab technician.
15485 W. 44th Ave., Suite A
Golden, CO 80403
303 277-9848

E-Mail/Website: LSCummings@aol.com

Analytical and Materials Testing Services for Historic Preservation

Philadelphia Museum of Art Conservation Department

Specialty: Organic coatings, paint films, pigments, fillers, metal corrosion products, ceramic and stone degradation products.

Equipment/Techniques: In house: FTIR; GC-MS; XRD; fluorescence microscopy, PLM, metallography.
Access to: EPMA; SEM /EDS; XRF; Auger.

Sample Required: Varies with instrument.

Waiting Period: Department's work has priority; outside work as time permits.

Fees: Depends.

Comments: Services available for institutions and conservators without analytical resources.

Contacts: Andrew Lins, Conservator/ Corrosion Scientist
Beth A. Price, Conservator and Conservation Chemist.
Marigene H. Butler, Head of Conservation.
Benjamin Franklin Parkway at 26th Street, Box 7646
Philadelphia, PA 19130-7646
215 763-8100 general; 215 684-7540 Cons.
Fax: 215 236-4465; 215 236-4465 Cons

E-Mail/Website: conserve@libertynet.org

PSI (Professional Service Industries)

Specialty: Construction materials testing (A2LA accreditation).

Equipment/Techniques: Soil testing; nondestructive testing; asbestos survey; air/bulk analysis; on-site laboratory set up; moisture/density testing.

Sample Required: Depends.

Waiting Period: Depends.

Fees: \$32/hr. for sampling, \$50-\$85/hr. for engineering, testing \$12.50-\$150/test.

Comments: Recommend two of their test laboratories, general company information on file.

Contacts: Greg Barbuto, Department Manager, Construction Services
Sarah Lynn, Business Development Coordinator;
James Ellis, Business Development Manager;
Donald R. Scott, Vice President of Operations;
Jay Robinson, NDE Services Manager.
12812 N. E. Marx Street
Portland, OR 97230
503 254-8418
Fax: 503 252-5608

Analytical and Materials Testing Services for Historic Preservation

PSI (Professional Service Industries) Forest Products Department

Specialty: Testing of wood products.
Equipment/Techniques: Accelerated aging; compression; cycle delamination; flexure of lumber; formaldehyde sampling; gradation; lignin; linear expansion; moisture content; nail and screw holding; Taber abrasion; static bending; tension; structural use tests; more.
Sample Required: Depends.
Waiting Period: Depends.
Fees: Minimum \$100; tests from \$9 (moisture) to \$450 (Formaldehyde sampling) and higher.
Comments: Total cost will depend on number of tests required; volume discount
Contacts: Randy Webb, Division Manager
545 Conger Street
Eugene, OR 97402
541 484-9212
Fax: 541 344 2735

SEAL Laboratories

Specialty: Metallurgy, Material Science, metal.
Equipment/Techniques: Electron Microscope lab: SEM/EDS (JEOL 6400, 6100, JSM 35C); Surface Analysis Lab: SAM (JEOL JAMP-10) and SIMS (KRATOS 800); XPS/ESCA (SSX-100-01 SMALL SPOT XPS/ESCA system); Organic Analysis lab: FTIR; XRF; XRD; TGA; DSC; DMTA.
Sample Required: Depends.
Waiting Period: Depends on customer's requirements.
Fees: Staff time: \$140-\$200; analysis: \$50-\$500 per sample or \$150-\$290 per hour.
Comments: "Scanning Electron Analysis Laboratory" Company folder on file.
Contacts: Roland H. Marti, M.S., President
Arun Kumar, Ph.D, Vice President;
Syavash Ensha, Ph.D., Michael Neff, M.S., Metallurgy & Mat. Science;
Jim A. Curiel, Consulting Metallurgist;
James W. Mason, Ph.D, Chief Chemist; more.
250 North Nash Street
El Segundo, CA 90245
310 322-2011
Fax: 310 322-2243
E-Mail/Website: seallab@aol.com
<http://home.earthlink.net/~seallabs>

Analytical and Materials Testing Services for Historic Preservation

Society for the Preservation of New England Antiquities (SPNEA)

- Specialty:** Varnish and pain on furniture, polychrome sculptures & other wooden objects.
- Equipment/Techniques:** UV/VIS light microscopy for cross-section analysis of paints and varnishes; PLM for pigment, fiber and wood identification; Minolta Chroma Meter CR-241 for color measurement for color matching paint layers.
- Sample Required:** See below.
- Fees:** Based on exam time and number of samples.
- Comments:** We recommend sending objects rather than samples for surface examination under the stereomicroscope and ultraviolet illumination before sampling.
- Contacts:** Keith Bakker, Senior Furniture Conservator
185 Lyman Estate
Waltham, MA 02154
617 891-1985
Fax: 617 893-7832

University of Arizona NSF Arizona AMS Facility

- Specialty:** Radiocarbon dating.
- Equipment/Techniques:** AMS Laboratory, 10BE measurements (Be oxide targets), C14 measurements.
- Sample Required:** Depends on material, 5mg to 1g or more.
- Waiting Period:** n/a
- Fees:** \$200-\$500 per sample, depending on type of organization.
- Comments:** Financed by NSF and user fees; scientific and historical studies.
- Contacts:** Rosemary Maddock, Administrative Assistant
1118 East Fourth St.
P.O. Box 210081
Tuscon, AZ 85721
520 621-6810
Fax: 520 621-9619
- E-Mail/Website:** AMS@ccit.arizona.edu

Analytical and Materials Testing Services for Historic Preservation

University of California at Berkeley

Forest Products Laboratory

Specialty: Wood.

Equipment/Techniques: SEM; light microscopy; chemical analysis; insect analysis; nondestructive evaluation; fire lab.

Sample Required: Depends on analysis.

Waiting Period: Depends on analysis and work load.

Fees: Hourly charge plus expenses; estimated cost provided on request; Staff are available to answer routine questions on a non-fee basis.

Comments: Short-term use of facilities by private sector, workshops, contract research, library.

Contacts: Stephen Quarles, Ph. D., Head, Service to Industry Program
Tom Briner (Fire lab);
Wayne Wilcox (SEM);
Larry Cool (chemical analysis, pulping);
Vernard Lewis (insect analysis);
Steve Quarles (wood species identification, preservation evaluation, diagnostic services, mechanical testing).
1301 South 46th Street
Richmond, CA 94804-4698
510 215-4215 (S. Quarles)
Fax: 510 215-4299

E-Mail/Website: steveq@nature.berkeley.edu; arnops@nature.berkeley.edu

Analytical and Materials Testing Services for Historic Preservation

University of California at Riverside Department of Chemistry

Equipment/Techniques: NMR.
Sample Required: Depends.
Waiting Period: Depends.
Fees: Depends.
Comments: A limited number of analyses can be performed; call for details.
Contacts: Dallas Rabenstein, Professor
Riverside, CA 92521-0403
909 787-1012
E-Mail/Website: DLRAB@MAIL.UCR.EDU

University of California at Riverside UCR Mass Spectrometry Facility Chemistry Department

Specialty: Organometallics, peptides, oligonucleotides, carbohydrates.
Equipment/Techniques: VG-ZAB2SE high resolution mass spectrometer, EI/CI, FAB capability; VG7070EHF high resolution mass spectrometer, EI/CI capability; Vastec LaserTec Time of Flight with MALDI capability; HP 5989A GC/MS/IR; Finnigan MAT 900 high resolution mass spectrometer, EI, ESI, APCI capability.
Sample Required: Specific instructions available.
Waiting Period: Two weeks average.
Fees: Federal or state funds: \$10-30 per sample, \$25/hr.; others \$75-125 per sample.
Comments: Non federal/state funded work only performed if no other facility available, Contact first.
Contacts: Richard Kondrat, Ph. D.
Charles Wilkins
Riverside, CA 92521
909 787-5287
Fax: 909 787-4713
E-Mail/Website: mspec@mail.ucr.edu;
<http://www.chem.ucr.edu/facilities/ms/ms.html>

Analytical and Materials Testing Services for Historic Preservation

University of Cincinnati

Department of Civil and Environmental Engineering

Specialty: Material testing.
Sample Required: n/a.
Waiting Period: n/a.
Fees: n/a.
Comments: Testing only if related to the mission and generally unavailable from any other source.
Contacts: Richard Miller, Ph. D.
Kathy A. Blazer, Director, Operations (contracts, invoicing).
P. O. Box 210071
Cincinnati, OH 45221-0071
513 556-3648
Fax: 513 556-2599

University of Cincinnati

Leather Industries Research Laboratories

Specialty: Hide, leather, leather product, evaluation, specification testing, defect diagnosis.
Equipment/Techniques: Diagnostic and Analytical: Chemical lab, video microscopy, physical testing equipment, spectrophotometry (AA, IR, UV-VIS), GC, HPLC; access to equipment in other University departments; testing in accordance with industry standards.
Sample Required: Depends, sample should be accompanied by written service work request and authorization.
Waiting Period: One week or less, depending upon type of work
Fees: \$150/hr. Can be negotiated.
Comments: Lab certified under the Qualified Laboratory List #18415, work confidential.
Contacts: Nicholas J. Cory, Ph. D., Director
Kadir Dönmez, Research Associate.
P. O. Box 210014
Cincinnati, OH 45221-0014
513 556-1200
Fax: 513 556-2377
E-Mail/Website: corynj@ucunix.san.uc.edu

Analytical and Materials Testing Services for Historic Preservation

University of Delaware Art Conservation Department

Specialty: Stone, ceramic.
Equipment/Techniques: Thin section petrography (PLM can be supplemented by XRD analysis and/or SEM when needed).
Sample Required: Depends on material, type of object and research questions. Please consult prior to submitting samples.
Waiting Period: Negotiable.
Fees: \$60/sample.
Comments: Characterization of ceramic and stone materials from artifacts and architectural elements.
Contacts: Chandra L. Reedy, Ph. D., Associate Professor
303 Old College
Newark, DE 19716
302 831-8238
Fax: 302 831-4330
E-Mail/Website: chandra.reedy@mvs.udel.edu

University of Delaware Bartol Research Institute

Specialty: Metal, ceramic, marble, glass, etc.; elemental composition from sodium to lead.
Equipment/Techniques: PIXE using an external 0.5 mm beam-can be reduced to 50 μ m for special cases.
Sample Required: Any size or shape, no special requirements or mounting.
Waiting Period: One week or more, depends on extent of project.
Fees: Depends, fee structure is competitive and reasonable.
Contacts: Prof. Emeritus Charles P. Swann
217 Sharp Laboratory
Newark, DE 19716-4793
(302) 831-1279
Fax: (302) 831-1843
E-Mail/Website: swann@brivs2.bartol.udel.edu

Analytical and Materials Testing Services for Historic Preservation

***University of Illinois at Urbana Champaign
Program on Ancient Technologies & Archaeological Materials (ATAM)***

Specialty: Ceramics, metal, museum objects
Equipment/Techniques: XRD; SEM/EDS; AAS; X-radiography; XRF; SIMS; SAM; RBS; XPS; TEM, C-14 dating.
Comments: Facilities are available through cooperation with other campus laboratories.
Contacts: Sarah Wisseman, Ph. D., Director
901 S. Mathews Avenue
Urbana, IL 61801
217 333-6629
Fax: 217 244-0466
E-Mail/Website: wisarc@uiuc.edu;
<http://www2.uiuc.edu/unit/ATAM/>

***University of Maryland
Department of Materials and Nuclear Engineering***

Specialty: Aging of cellulosic textile, cellulosic material.
Equipment/Techniques: IR, UV, DSC, DTA, SEM, FTIR microscopy.
Sample Required: Depends.
Waiting Period: Depends.
Fees: Depends on services provided, interpretation for an additional fee.
Contacts: Ira Block, Associate Professor
2100 Marie Mount Hall
College Park, MD 20742-7531

Analytical and Materials Testing Services for Historic Preservation

University of Missouri-Columbia Research Reactor Center

Specialty: Pottery, ceramic, clay, obsidian, basalt, tephra, chert.

Equipment/Techniques: 10 MW light-water-moderated reactor for neutron activation analysis; three high-purity germanium detectors with sample changers; two petrographic microscopes; lab balance; rock saws; programmable furnace; 10 personal computers.

Sample Required: 50-500 mg.

Waiting Period: Minimum 2 months, up to 6 months.

Fees: 50 pottery samples: \$100-120/sample; obsidian sourcing \$35-150.

Comments: Archival collection of more than 28,000 archaeological specimens; NSF-Site.

Contacts: Michael Glascock, Ph. D., Group Leader, Archaeometry Lab
Hector Neff, Senior Research Scientist.
James W. Cogswell, Research Specialist.
R. Sergio Herrera, Senior Research Lab Technician.
Research Park
Columbia, MO 65211
573 882-5270
Fax: 573 882-6360

E-Mail/Website: glascock@reactor.murr.missouri.edu;
<http://www.missouri.edu/~murrwww/archlab.html>

Analytical and Materials Testing Services for Historic Preservation

***University of Oxford
Materials Science-Based Archaeology Group
Department of Materials***

- Specialty:** Metals and metal-related material and processing debris, especially archaeological and industrial copper and iron alloys.
- Equipment/Techniques:** Electron probe microanalysis (EPMA) for Fe, Cu, Sn, Ag, Pb, Au alloys; access to XRF and scanning proton microprobe with external beam line (PIXE/RBS) for non-intrusive analysis; SEM/TEM/STEM; optical microscopy; limited access to XRD.
- Sample Required:** Samples must be submitted with full documentation (and photographs where appropriate). For large scale projects site visits can be arranged.
- Waiting Period:** 4 weeks from receipt for small batches of samples; rush orders will incur an additional charge. Schedules for large projects to be negotiated.
- Fees:** From \$35 to \$70 per sample depending on material and requirements; From \$240 for more complex analyses.
- Comments:** Limited storage for objects, FedEx or overnight mail for samples and reports.
- Contacts:** Dr. Peter Northover, Research Fellow
Mr. Chris Salter
Parks Road
Oxford, OX1 3PH, United Kingdom
01144 1865 273779
Fax: 01144 1865 273794
- E-Mail/Website:** peter.northover@materials.ox.ac.uk

Analytical and Materials Testing Services for Historic Preservation

University of Toronto

The Canadian Centre for Accelerator Mass Spectrometry at the ISOTRACE Laboratory

- Specialty:** Radiocarbon analysis; trace metals analysis.
- Equipment/Techniques:** Accelerator Mass Spectrometer and sample preparation laboratories for radiocarbon, iodine-129 and trace metal samples. Radiocarbon analysis: Preferred minimum sample size is 2.5 mg carbon; smaller samples can be analyzed at reduced precision; specialized external facilities available for unusual samples.
- Sample Required:** Trace metal analysis: mineral grains as small as 0.5 mm dia; consult for other materials.
- Waiting Period:** Radiocarbon Analysis: 2-3 mths.; occasionally 4-5 mths.; express service at 100% premium; Trace metals analysis: 2-3 mths.; consult for scheduling.
- Fees:** \$490 (CO₂) to \$790 (protein) for normal precision; \$790 to 1,090 for high precision.
- Comments:** Rates for academic work lower than for commercial work (different overhead charges).
- Contacts:** Dr. W. E. (Liam) Kieser, Assistant Director
60 Saint George Street
Toronto, Ontario, CANADA, M5S 1A7
416 978-2258;
Fax: 416 978-4711
416 978-2241 (Liam Kieser)
- E-Mail/Website:** isotrace.lab@utoronto.ca; liam.kieser@utoronto.ca
<http://www.physics.utoronto.ca/~isotrace>
- Others:** Radiocarbon Analysis: Dr. Rolf P. Beukens; Phone: 416 978-4628;
E-mail: roelf.beukens@utoronto.ca
Trace Metal Analysis: Dr. Graham Wilson; Phone: 416 978 4041;
E-mail gcw@quartz.geology.utoronto.ca

Analytical and Materials Testing Services for Historic Preservation

***University of Wisconsin
Department of Anthropology
Laboratory of Archaeological Chemistry***

Specialty: Archaeological material: bone, pottery, ceramic, stone, pigment, soil, mortar.

Equipment/Techniques: 2 wet labs; ICP Spectrometer; access to EM and XRD

Sample Required: Destructive analysis, normally requiring less than a few grams.

Waiting Period: n/a.

Fees: Charged on a cost recovering basis, varies with project and number of samples.

Comments: Not a 'contract' facility, but accepts many projects; informative website.

Contacts: T. Douglas Price, Ph. D., Professor, Director
Dr. James Burton, Associate Director, manages the lab.
Madison, WI 53706
608 262-2575 (Price); 262-4505 (Burton)
Fax: 608 265-4216

E-Mail/Website: TDPrice@facstaff.wisc.edu; jhburton@facstaff.wis.edu;
<http://www.wisc.edu/anthropology/larch/larch.htm>

***Vassar College
Chemistry Department***

Specialty: Organic archaeometry, amber, fossil resin, resin, tar, oil, fat, wax.

Equipment/Techniques: Fourier-Transform Infrared Spectrometer; Fourier Transform Nuclear Magnetic Resonance Spectrometer. Gas Chromatographs; Mass Spectrometer.

Sample Required: 2-100 mg, depending on the nature of the sample and the type(s) of analysis required.

Waiting Period: 3 to 6 months.

Fees: Non-profit organization, does not charge fees.

Contacts: Curt W. Beck, Professor Emeritus
Seeley G. Mudd Chemistry Building, #205
Poughkeepsie, NY 12601
914 437-5752

E-Mail/Website: beck@vassar.edu

Analytical and Materials Testing Services for Historic Preservation

West Coast Analytical Services

Specialty: Trace analysis, capability for difficult or obscure methods.
Equipment/Techniques: GC-MS; GC; LC; IC; FITR Spectroscopy; ICP/MS; CE.
Sample Required: Small
Waiting Period: 1-2 weeks
Fees: Detailed fee schedule on file; (Company folder).
Comments: Fast, good; worked for LACMA; GCI main lab for outside services; staff of 30, including 2 PhD/MD, 20 engineers & scientists, 2 technicians; Certified: AIHA, CA-DOHS, LCMS, A2LA; interested in result; quarterly newsletter.
Contacts: D. J. Northington, President
Eric W. Lindsay, Project Manager
9840 Albutis Avenue
Santa Fe Springs, CA 90670
562 948-2225
Fax: 562 948-5850

Analytical and Materials Testing Services for Historic Preservation

Williamstown Art Conservation Center, Inc.

- Specialty:** On-site or in-lab exam of objects and surfaces; exam of physical structure; determination of physical properties; identification of adhesives, binders, ceramics, coatings, deterioration products, dyes, fibers, glass, liquids, metals, paints, pigments, & synthetic polymers.
- Equipment/Techniques:** Visual examination using visible and ultraviolet light, stereomicroscopy, and fluorescence microscopy ; object imaging with infrared reflectography, X-radiography and digital photography; physical testing of solubility, melting point and hardness; non-invasive surface analysis using FT-IR; sample analysis using wet chemistry, PLM, fluorescence microscopy, chemical microscopy, FT-IR microscopy with ATR, TLC (access to SEM-EDS, UV-VIS, GC/MS, HPLC, AAS and XRD.
- Sample Required:** Varies by technique; sampling kit provided.
- Waiting Period:** 5-10 business days; express service available.
- Fees:** \$63/hr. plus materials for conservators and non-profit institutions; quotations provided by sample or project.
- Comments:** Emphasis on practical application in treatment, technical study, interpretation, authentication and dating. Provide review of presentation texts and manuscripts for technical accuracy. Own/administrate listserv dedicated to discussion of conservation science topics Materials-L@williams.edu
- Contacts:** James S. Martin, Director of Analytical Services & Research Associate; Conservator of Paintings
225 South Street
Williamstown, MA 01267
413 458-5741
Fax: 413 458-2314
- E-Mail/Website:** j.martin@williams.edu or james.s.martin@williams.edu